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Route To:

Subject: Bark Beetle Activity in Recreation Sites on the Lakeside RD (lakesiderd)

To: District Ranger, Lakeside RD

I was requested to assess bark beetle activity in developed recreation sites on the Lakeside RD, Apache-Sitgreaves NFs. On September 21–23, 2004, I traveled to the Lakeside Ranger District to evaluate and discuss prevention and suppression projects in these recreation sites with District staff (Sharon Wallace, Randall Chavez). I describe in this report what bark beetle activity was observed in these areas, summarize the effectiveness of the preventive spray project, and make recommendations to minimize bark beetle impacts in the future. A full description of prevention and control alternatives was described in my 2002 and 2003 site visit reports.

Bark beetle activity on the Apache-Sitgreaves NFs

A detailed summary of the aerial detection survey results will be provided to the Forest at a later date; however, our preliminary analysis showed that ponderosa pine mortality has decreased in 2004 compared with 2002 and 2003. This trend of decreased bark beetle activity is similar to what has been observed in the majority of Arizona during 2004. Nonetheless, there are still areas that are experiencing considerable pine mortality and the population of bark beetles is still relatively high.

Inspection of fading trees and collected specimens determined that *Ips* beetles (*Ips pini*, *I. lecontei*, and *I. calligraphus*) were the primary cause of ponderosa pine mortality on the Lakeside RD. *Ips pini* (the pine engraver beetle) is widespread throughout the West and can occasionally reach outbreak proportions (Kegley, et al., 1997). On the west side of the Lakeside RD, *I. lecontei* (Arizona 5-spined ips) populations have increased and are killing trees in and around the Rodeo-Chediski Fire. This *Ips* species is considered to be an aggressive ponderosa pine killer historically below the Mogollon Rim (Massey and Parker, 1981; Parker, 1991) and has caused extensive tree mortality on the Prescott and Tonto NF's over the previous three years. Several of the larger-diameter pine with top-kill also have western pine beetle (*Dendroctonus brevicomis*) in the lower portion of the trunks. Populations of this bark beetle increased throughout much of Arizona in 2003. Other bark beetles species are present in ponderosa pine forests across the Forest, but are not considered tree killers (i.e., red turpentine beetle (*D. valens*)) or are at very low populations (i.e., other *Ips* species and roundheaded pine beetle (*D. adjunctus*)).

Bark beetle activity in developed recreation sites

Trees growing in developed recreation sites are often stressed due to repeated damage caused by campers and soil compaction caused by roads and large vehicles parked off-road. During periods of drought or below-average precipitation, such has been occurring over the last few

years, these trees can become extremely stressed. This is further exacerbated by the relatively high density of ponderosa pine growing in several of the campgrounds. When trees are growing at high densities, there is a greater amount of inter-tree competition for limited resources such as light, water, and nutrients (Kolb, et al., 1998). The combined effect of these factors is lower production of defensive compounds by the trees and, consequently, increased susceptibility to bark beetle attack. Bark beetles may also prefer these dense stands, as compared to more open stands, due to microclimate differences (Amman and Logan, 1998).

From September 21 through 23, I examined nearly all developed recreation and administrative sites on both the Lakeside RD. I conducted a similar survey of these same sites the previous two years also in September and October (site visit reports dated October 22, 2002 and October 5, 2003). My surveys of the four recreation sites consisted of walkthroughs looking for fading trees, pitch tubes, and boring dust. It is important to note that a more intensive survey may find additional infested trees and additional trees may have become infested after my survey was completed. Therefore, the numbers of infested trees reported here should not be considered absolute.

Lakeside RD – In addition to some of the sites being comprised of densely stocked ponderosa pine stands, several of the recreation sites on the Lakeside RD are a mixture of piñon pine-juniper-ponderosa pine stands.

Lakeside District Office – A total of eight current infested pines were detected on the compound or directly adjacent to the compound on private land. Additional mortality was observed within the vicinity. For example, the green waste dump site has a few current infested trees and likely infested cut material on its ground, which is close to the rear portion of the compound (***Figure 1***). Also, a burn pile near the back of the compound was observed to contain *Ips*-infested slash. This material should be burned soon to help reduce the local population of *Ips*.

Figure 1. *Ponderosa pine currently infested with bark beetles at the green waste dump site in Lakeside.*

Lakeside Campground – Three small-diameter and two large-diameter infested pines were found in the campground. All of these trees had already been felled and bucked to be removed from the site or will be completed in October. A limited number of additional infested trees were observed within the vicinity.

Scott Reservoir Campground – Eight current infested and four previously infested (attacked late 2003 or early 2004) ponderosa pine were seen within the immediate vicinity of this recreation area. Scattered ponderosa pine mortality is occurring across the lake from the campground.

Mogollon Trailhead – Twenty-two current infested and 17 previously infested ponderosa pines and were detected around the parking area and trail. Additional infested pines were observed within the vicinity of this recreation site.

Woodland Lake Park – Twenty-five current infested and several small pockets of previously infested were observed within the Park. Much of the forested area within the Park is marked for thinning with an emphasis on removing small diameter and dwarf mistletoe-infested pines.

Fool Hollow Lake – Eighty one current infested and 80 previously infested ponderosa pine were found on the Park grounds (***Figure 2***).

Lewis Group Area – A total of 22 current infested and thirteen previously infested ponderosa pine were found within the campground and the road leading into the recreation site. Most of the adjacent forested area that had been more severely burned was infested with *Ips* species and western pine beetle over the last two years.

Pinedale Work Center – Six currently infested and 5 previously infested ponderosa pines were observed on work center grounds.

Camp Grace - Four currently infested and 7 previously infested ponderosa pines were observed on or adjacent to the camp property.

Camp Tatiyee - Five currently infested and 4 previously infested ponderosa pines were observed on or adjacent to the camp property.

Figure 2. *Ponderosa pine currently infested with bark beetles at Fool Hollow Lake Recreation area.*

Effectiveness of preventative sprays for bark beetles in recreation sites

I describe here the effectiveness of the 2004 spray project. Ponderosa pine trees were sprayed with Sevin SL at 9 recreation and administrative sites across the Lakeside District during April. In general, the spray seemed to be very effective at preventing trees from being successfully attacked by beetles. Only four trees out of more than 1,953 trees sprayed were successfully or partly attacked by bark beetles despite heavy beetle pressure in many of the areas treated. Of these four attacked trees; one was only attacked at the top of the bole, suggesting that the spray had not adequately reached the top of the tree, and two had been struck by lightning. More than 200 trees that were adjacent or near spray trees, but not sprayed, were successfully attacked by bark beetles in 2004.

Recommendations

Because the current beetle infestation is occurring on the landscape scale and is largely a result of the ongoing drought, it is essentially impossible to control the beetle population as a whole through management actions. Therefore, control actions should be limited to the most critical, high-value areas that have adequate accessibility.

Based on the current weather and stand conditions, setting, and large population of bark beetles within the immediate area, trees within many of the campgrounds continue to be highly susceptible to beetle attack. Therefore, a combination of removal of infested trees, application of preventive insecticide sprays, and thinning is recommended for many of the sites.

In the short-term, prompt removal of currently infested trees will help to reduce the immediate local population of beetles. However, because these insects are very common, removal of infested trees is not a guarantee of protection. Therefore, this approach is generally recommended in combination with the long-term preventive approaches of thinning and in the short-term preventative spraying while beetle populations remain high. It is recommended that the infested trees be removed yet this fall before the brood completes their development and adult beetles emerge. Felling of infested trees will not kill developing brood; infested trees must either be removed from the site or treated on site.

Thinning projects are or will be occurring at the Lakeside Campground, Woodlands Park, and possibly the area of land including Camp Grace, Camp Tatiyee and the Mogollon Trailhead. When carrying out thinning prescriptions, careful management of the slash should be considered while populations are high. Removal of thinning slash from the recreation areas is the best option. If treated on-site, burning, chipping, or burying green will help to reduce the potential for an additional population increase of beetles. It is recommended that the infested trees be removed or treated before early spring (i.e., by April 1st), which is prior to the brood completing their development and adult beetles emerge.

Funds may be available for FY2005 from Forest Health Protection to manage bark beetle activity. Requests for these funds should be in no later than October 15, 2004.

If you have any questions regarding my assessment of current bark beetle activities within the project area, its potential effect on residual standing trees, or my recommendations, please let me know. I can be reached at (928) 556-2074.

/s/ Joel D. Mcmillin
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cc: Mailroom R3 Apache Sitgreaves, Randall Chavez, Sharon I Wallace, Deb Bumpus, Joseph A Hamrick, John Anhold, Debra Allen-Reid, Leonard Lucero, Edward Collins

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